The Influence of Blockchain Technology on Fraud and Fake Protection

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I. INTRODUCTION

A. Motivation of this research

Today, Blockchain technology is a big issue in the world. For example, one of the popular Blockchain services is a cryptocurrency, which is mostly known as bitcoin financial transactions, and has a far-reaching potential to improve both society and government systems. It has been used in healthcare, smart contracts, and personal identification, among other areas. Also, Blockchain is one of the biggest trends in emerging technology, and it has been leveraged for social and environmental impact on both financial and non-financial transactions. However, "Only 4% of Americans think the marketing industry behaves with integrity, and nearly half of consumers surveyed say they don't trust any news source" (Morrison, 2015). As Morrison mentioned, we live in an era of distrust because of the fake news epidemic. No one trusts news media and advertising; thus transparency is vital in business. Moreover, just as fake news is a phenomenon of greater social ills, fraud and theft are also one of the ethical and social issues that should be resolved to promote a more trustworthy society (Lyons, 2018). According to the Association of Certified Fraud Examiners, every year over 3.5 trillion dollars has been lost by businesses to fraudsters (PYMNTS, 2016). Fraud attacks are a critical issue in business and everywhere; thus all companies need to protect themselves including the transaction and the customer information. To protect

fraud attacks, Blockchain technology plays a big role because Blockchain can contribute to making business networks less susceptible to fraud with some features (Ross, 2017). Moreover, this revolutionary technology has brought positive changes across businesses, communities, and society such as a digital ledger, smart contracts, supply chain management, intellectual property, "democracy 2.0," and so on (Bede, 2018). Therefore, the Blockchain technology will be one of the most important attributes in cybersecurity in the near future because transparency, visibility, and the integrity of businesses are an essential factor in a era of distrust in which consumers suspect that brands have something to conceal. In this research, we will focus on fraud and counterfeiting prevention in some areas once the risks of fraud and theft issues are be addressed by revolutionary technology.

B. Objectives of the research

This paper aims to survey current approaches and solutions that make use of Blockchain in minimizing the fraud and theft issues in some businesses and our society. Although some people insist that Blockchain technology will bring big changes into our life because it has a lot of underlying benefits, other individuals and some governments still have concerns in using Blockchain to enforce trust. It is shown that companies often suffer a profit loss because of fraud committed by their employees as well as their reputations for the trust of the customers. In addition, offline sales are declining, and online transactions have risen up to 60%. Trustworthiness has become a more critical attribute of the provider-customer and buyer-seller relationship. Customers may leave a brand if they perceive it as untrustworthy or lacking a positive reputation (Demers, 2017). To earn more trust or to maintain their current reputation, some companies are spending a huge amount of money by introducing Blockchain technology. Therefore, this paper will

investigate the influence of how Blockchain technology can help to prevent or reduce fraud and counterfeiting problem in several businesses.

C. Problem statement

There are some benefits of using Blockchain technology across businesses, communities, and society: reducing profits loss from fraud attacks and fraudulent behavior, securing business processes in finance and supply chain.

II. OVERVIEW

A. What is Blockchain technology?

Blockchain is a new method of storing data in a distributed ledger that allows multiple stakeholders to share access to the same information securely. The definition of Blockchain technology is "a digitized, decentralized, public ledger of all cryptocurrency transactions" ("Blockchain", n.d). It allows transactions to be recorded and added to the block in chronological order and keeps track of the digital currency transactions without central recordkeeping. Currently, the technology is mainly used to verify transactions within digital currencies; thus, it can be digitized, coded, and inserted into practically any document in the Blockchain. In addition, the record's authenticity is verified by the entire community using the Blockchain instead of a single centralized authority.

B. How Blockchain works

The Blockchain technology is combined with three main technologies: private key cryptography, a distributed network with a shared ledger, and an incentive to service the network's transactions, record-keeping and security (Nolan, www.coindesk.com). Below, we explain how these technologies work together to secure digital relationships. If two participants wish to initiate a transaction via the Internet and each of them holds a private and public key, a combination of a

private and public keys creates a digital signature that gives a robust control of ownership. For secure digital relationships, approving transactions and permissions must be needed, and it starts with a distributed network which uses mathematical verification with a lot of computing power. A Blockchain consists of a digital signature, timestamp, and relevant information, and these are broadcasted to all nodes in the network. For example, when a transaction issues, all parties provide consensus before it is encoded into a block of digital data and each block is connected to the one at the distributed network. Then, blocks are chained together to prevent any block from being modified or inserted between two existing blocks. Here is an example of how Blockchain works (See Figure 1):
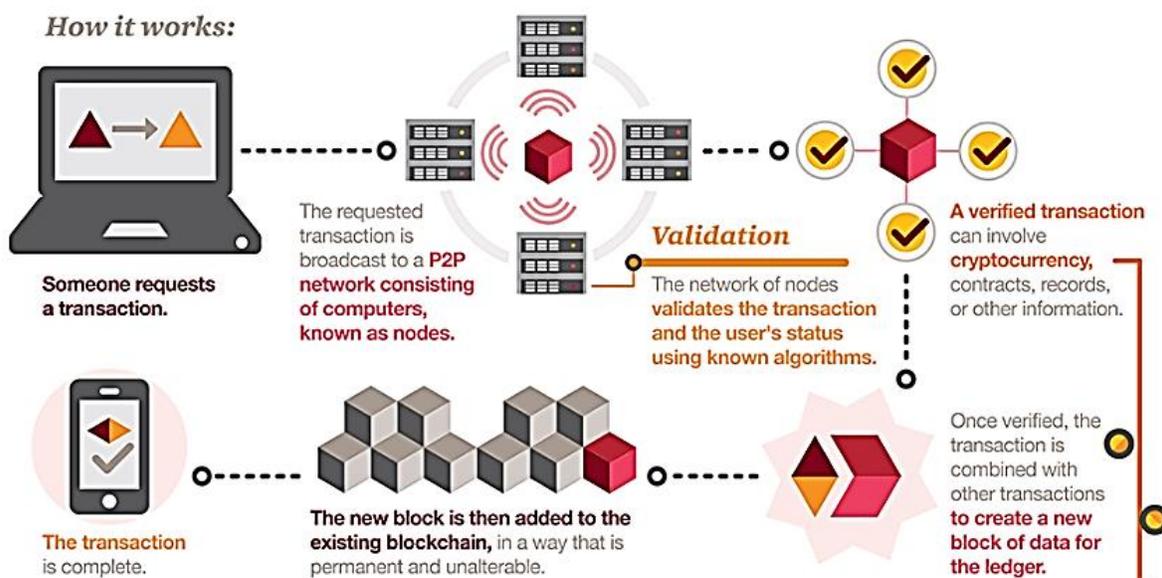

How it works:

Someone requests a transaction.

The requested transaction is broadcast to a **P2P network consisting of computers, known as nodes.**

Validation
The network of nodes **validates the transaction and the user's status using known algorithms.**

A verified transaction can involve **cryptocurrency,** contracts, records, or other information.

The transaction is complete.

The new block is then added to the **existing blockchain,** in a way that is permanent and unalterable.

Once verified, the transaction is combined with other transactions **to create a new block of data for the ledger.**

Figure 1. How Blockchain Operates (PwC's Digital Pulse 2016)

A participant registers a transaction and the new transaction is recorded as a block in the digital ledger then broadcast to all members of the network. After that, participants in the Blockchain network offer a consensus to approve the new transaction. Next, the block is added to the chain in the network and the update or changes are shared with all authorized members.

C. Main features in Blockchain technology

What makes Blockchain interesting is that Blockchain can increase the integrity of the transactions financially and non-financially. Traditional transactions are complex and often delayed. There are also potential losses from human errors or fraud as each participant has their own separate ledger. However, Blockchain technology can address those problems involving ordinary transactions by eliminating or reducing paper processes and transaction times and also increasing efficiencies. In addition, all parties should provide consensus for each new transaction and can see all details of each one from end-to-end. Thus the transaction cannot be altered and vulnerabilities are reduced. Furthermore, Blockchain can contribute to enhancing efficiency, auditability, traceability, and feedback (Treagust, 2017).

III.   UTILIZATION OF BLOCKCHAIN TECHNOLOGY IN BUSINESS

There are a handful of uses for Blockchain technology in a variety of commercial applications today like coffee, seafood verification, food safety, pharmaceuticals, automotive supply chain, and diamond trade. The following explains how Blockchain benefits some businesses to address the fraud and counterfeit issues commonly found.

A. Fraud prevention

According to the index, the number of fraud attempts and the cost of protecting those fraud issues has grown substantially from the beginning of 2015 "when less than $2 out of every $100 was subject to a fraud attack. In Q1 2016, the reach of fraud attacks climbed to affect more than $7 out of every $100" (PYMNTS, 2016). As fraud attempts become more sophisticated, merchants and security firms have to invest more money into fraud detection systems. According to Ross Mauri, "There are several methods fraudsters use to conceal their criminal activities, including altering or

deleting information in a company's accounting systems, changing electronic or paper documents and creating fraudulent files." Blockchain technology contributes to reducing fraud crime by using a shared digital ledger in which the visibility and transparency of the transactions can be advanced among the participants of a business network. Also, members of the Blockchain network can not only check the history but transfer their assets. So it is easy to prove fraudulent transactions. Moreover, deleting and changing the transaction records on Blockchain are invariable without consensus from all participants. Thus the transactions become more secure and less susceptible to fraud via the Blockchain network. Furthermore, a timestamp is given by Blockchain transactions so members for the transaction can see the source of an asset (where the asset came from) including ownership for it. As a result, fraud loss in the business can be reduced and employee morale can be increased by Blockchain technology.

B. Food trust

Blockchain will give benefits to reduce and prevent fraud in the food supply chain through greater transparency and improved traceability of products. The regulators in the company or government agency should check when problems occur in the food supply chain. Still, there is no way to observe the entire picture with every step from farm to home or restaurant; thus, it takes much time to investigate as well as report information when using Blockchain documents. Some of the world's biggest grocery companies like Walmart, Nestle, and Dole are establishing a Blockchain, which is called Food Trust to trace the food supply chain throughout the world. This Blockchain will involve a recall procedure that avoids losses, identifies the problems, and reduces the time to solve the customer claims (Nash, 2018). Blockchain technology can be used to detect (and thus protect against) the implantation of fake or improper food ingredients. It could also remove middle layers which add to the cost by keeping the latest encrypted date on all participant's systems.

Ultimately, by investigating and keeping the record of food origination, suspect food should never reach supermarket shelves. Although it might take more years to transfer all paper-based data onto Blockchain, with this technology food poisoning or chemical contaminating should be prevented or controlled.

C. Diamond trade

Even though the international markets for diamonds and precious stones have taken steps with measures such as the Kimberley Process—a three-step verification method to check the origin of each stone—fraud and falsification issues are still social problems including child-labor. Therefore, the current process is not able to resolve violations of human rights or to support wars against legitimate governments. What's more, each year billions of dollars in losses result from fraudulent claims for lost jewelry in the insurance sector (Ambler, 2017). Therefore, some companies are willing to make efforts by using Blockchain as a way to solve the problem without finance violence in conflict zones. The technology will create the first Blockchain ledger for tracing stones from the mine to the place when they are sold to consumers. For instance, De Beers, the world's biggest diamond producer, introduced the first industry-wide Blockchain last January to track gems as well as ensure their stones are mined ethically to maintain customer confidence. Additionally, the Blockchain system will improve transparency and eliminate conflicts in the diamond trade (Marr, 2018). The diamond Blockchain could help to prove the ethical origins of other minerals and remove corporate risks, including fraud in financial transactions.

D. Automotive supply chain

According to an article from a Blockchain entrepreneur (Radocchia, 2018), over 80 million vehicles were recalled from 2016 to 2017. A massive number of recalls were caused by counterfeit items, and there are very few automotive companies that have well-organized systems to check the

end-to-end visibility of parts from entering to leaving their supply chain. If the automotive manufacture's supply chain is lacking visibility for the parts, the issues caused by the counterfeited parts might be more common, and their customers will be more exposed to the dangerous risks. The vehicle parts need to register on the Blockchain to resolve counterfeit parts issues in the automotive supply chain. Through this, companies can trace the place of origin and changes in the inventory efficiently. Therefore, car companies and their suppliers will remove the trust gap by developing the visibility of fake parts management. Car companies are able to trace and track the origin of the parts for each vehicle with Blockchain technology so that it is easy to recall when a faulty part triggers the problem in the car. Moreover, society will put more trust in the emerging technology because the more cars are automated and controlled by using a Blockchain-based system to eliminate faulty and counterfeit parts, the safer customers will be. Furthermore, Blockchain technology can create transparency between the buyer and the seller. For example, a French automaker, Renault, built a digitized car maintenance system that collects all the information about the car by the customers (Groupe Renault, 2017).

E. Online voting

Blockchain technology can not only create smarter and more secure supply chains, it can also assist with digital identity management. The blockchain is pioneering a transparent and secure business processes from traceable supply chains and also is a permanent identity for refugees. Here is another example of using Blockchain technology in identity management:

> Using a Blockchain technology system to vote could completely change the way in which we have always seen voting being done. Instead of visiting a registered polling station, voters will instead cast their votes from their mobile phones or personal computers. These

will then be logged in to an immutable Blockchain and utilized to reliably verify the results of the election. Voter fraud or other threats to the integrity of elections are an ongoing problem for election officials. (Violino, 2018)

In some countries, the integrity of the election is a controversial issue during each election period because many citizens cannot trust their government or voting system. Online voting by using Blockchain technology can be a solution to eradicate distrust in society for the election system by alleviating the potential for manipulation, recording errors, and tampering. Transparency and visibility of the voting process are vital to society. Therefore, some governments may be led to promote a Blockchain voting system to avoid identity frauds that are typically manipulated in traditional voting processes.

IV. CONCLUSION

In this paper, we explored how Blockchain technology will play a significant role and contribute to dealing with moral and ethical issues such as fraud, theft, or counterfeiting products. Blockchain technology can help to address some social and financial problems in many areas from finance, healthcare, supply chain, automobile, democracy, and so on by protecting against financial losses through fraud, cheating, and counterfeiting. Therefore, we need to focus on solving issues for both business and society. This Blockchain technology is paving the way to develop trust in the community by reducing fraud and falsity widely. Although many traditional or legacy systems should be changed, Blockchain technology has more chances to mature in a variety of businesses and industries, and it becomes a popular solution to address social issues in society.

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